



**STRATEGY
RESEARCH
PROJECT**

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**THE ARMY'S B-2 BOMBER – FIELD ARTILLERY
MODERNIZATION**

BY

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USAWC STRATEGY RESEARCH PROJECT

The Army's B-2 Bomber -- Field Artillery Modernization

by

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ABSTRACT

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In the case of field artillery we continue down the path of the past by justifying the need for expensive artillery systems based on the need to destroy massed tank and infantry formations. With the changing nature of warfare in the 21st Century we must have the courage to question whether the requirement for a new field artillery gun that provides high rates of generally inaccurate fire is valid. Here we fail. Rather than doing a fundamental assessment of our key 21st Century warfighting needs - precision strike and rapid mobility we continue to justify old Cold War type ideas. We are following the Air Force model of continuing to justify buying a system, the B-2 bomber, long after the world changed and its requirement disappeared. The Army needs to consider that given the changed conditions in the world is it maybe not time to retire cannon artillery to the museum just as we did with the cavalry horse and the air defense gun system Sgt. York.

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THE ARMY'S B-2 BOMBER -- FIELD ARTILLERY MODERNIZATION

"I do not know when or where, but we will sometime place soldiers in harm's way, on short notice and ask them to defeat a determined and dangerous foe. When that happens, we should be satisfied that we have done our best to prepare them for the task at hand."

General Dennis J. Reimer, CSA

Within the past ten years we have seen some remarkable changes in the World -- the fall of the Berlin wall (1989), the end of the Cold War, the Gulf War (1991), the breakup of our old nemesis the Soviet Union and the constant employment of the military instrument of national power around the world. These climactic events have generated a new geopolitical environment with security challenges that are radically different from our Cold War containment strategy. This new security environment is both dynamic and uncertain and contains a host of threats and challenges that requires us to develop a new national security strategy.¹

Our new national security strategy is based on the principle of engagement. The Department of Defense (DoD) plans to "execute the strategy with superior military forces that fully exploit advances in technology by employing new operational concepts and organizational structures."² This paper's thesis is that the Army is failing to achieve both the DoD goal and the Chief of Staff's vision in its Field Artillery modernization plans. To support this

effort we will address key 21st Century geo-strategic trends, the role of Army fire support, and the Army's fire support modernization strategy. From this base we will point out how the field artillery community is not achieving these goals, but like the Air Force's B-2 bomber the Army continues to buy and defend a system that represents Cold War thinking and operations. Recommendations and alternatives are provided that while general in nature, should provide fodder for the generation of other new ideas and discussion.

In the case of Army field artillery modernization we are continuing down the path of the past by continuing to justify expensive new systems based on the need to fight battles we will likely never see again, the need to destroy massed tank and infantry formations. This is similar to the Air Forces continued support for buying the expensive B-2 bomber even though the Cold War ended and the need for a penetrating strategic bomber went away. In both these cases the underlying requirements changed yet we continue to use scarce resources to build technological marvels that provide little to no useful military utility for combat in the 21st Century as witnessed in Bosnia, Haiti, and now Yugoslavia/Kosovo.

21ST CENTURY GEO-STRATEGIC TRENDS.

GLOBAL TRENDS.

The first key trend is globalization. This trend is bringing citizens from all nations closer together, provides increased idea sharing and goods transfers and the rapid dissemination of information.³ A second key trend is continuing population growth, particularly in the developing world (Asia, Africa, Latin American, etc). This growth in population fuels the continued urbanization of the world, crowding people into megacities.⁴ The third trend is the worldwide collapse of less well developed states into internecine or internal wars due to economic stagnation, ethnic, or religious disputes in less developed nations.⁵ We have seen these trends multiple times in such places as Bosnia, Rwanda, Zaire, Somalia, or in the case of the Russians in Grozny.

INFORMATION DISSEMINATION -- THE CNN EFFECT.

A recent phenomena born during the Gulf War and getting more powerful is the ability of television and other information conduits to show in real-time the effects of war and humanitarian crises. This information revolution has two major impacts on U.S. policy and military operations. One is the continuous showing of deaths and atrocities in the worlds failing states can cause a

media-generated public revulsion capable of compelling the U.S to intervene for humanitarian reasons.⁶ The other impact is television brings the reality of wartime carnage into everyone's home.⁷ What this has done is make the American public unwilling to accept high casualties either U.S., civilian or in some cases even our enemies.⁸ U.S. losses in Somalia, the destruction of the Al-Amariyah bunker in Baghdad and finally the killing of Iraqi forces on the "Highway of Death" are recent instances where U.S. operations were impacted by the CNN effect.

LEGAL/MORAL TRENDS.

The other areas where we are seeing changes are in our legal and moral obligations. We are seeing the U.S. public beginning to believe that it is neither necessary nor virtuous to kill civilians or destroy their livelihoods.⁹ Recently, we have had arguments that it was not moral for the U.S. to attack and incapacitate the Iraqi electrical grid and generation capacity because of the widespread civilian misery and deaths caused by effects on sanitation and health facilities.¹⁰ As Harry Summers stated about the recent Desert Fox operation, "Mr. Clinton knew the American people would not tolerate a massive and unrestricted bombing campaign that resulted in the deaths of innocent women and children".¹¹

These moral shifts have the potential to impact the evolution of three key law of war principles: military necessity¹²,

discrimination¹³ and proportionality.¹⁴ We can also "expect change in the trigger point at which the international laws of armed conflict apply to disputes and subsequent hostilities between states."¹⁵ Our use and emphasis on the capability of precision-guided weapons to reduce not only our casualties, but also to avoid "collateral damage," (the term we now use for civilian casualties) will bring us increased burdens along with the benefits. With our precision-guided weapons and our associated media hyping we are creating a greater public perception that we are always accurate, thus any significant collateral damage can only be due to negligence or misconduct of the commanders involved.¹⁶ Finally, with the establishment of the new permanent International Criminal Court we now have the possibility for an international body to decide that the negligence or misconduct discussed above could rise to the level of war crimes. As Judge Gabrielle K. McDonald, President Judge of the International Criminal Tribunal for the Former Yugoslavia stated, "a permanent International Criminal Court will be established this year, those who engage in the conduct of warfare should be aware that their behavior may be judged by standards developed by the international community."¹⁷

U.S. NATIONAL AND MILITARY STRATEGY.

With the end of the Cold War the United States had to develop new national and military strategies for the first time in over 40

years. Our national strategy of containment and its corresponding military strategy, which focused on defeating a Warsaw Pact invasion into Central Europe, were no longer viable. This end to the Cold War also required the Defense Department to produce a "peace dividend." This peace dividend required DoD to significantly reduce our forces stationed overseas, cut the size of our overall forces and required the development of new rationales to defend the continued modernization of our forces.

To replace these Cold War strategies and address the impacts from the ending of the Cold War the United States adopted a new security policy based on three core national security objectives; enhancing our security, bolstering America's economic prosperity and promoting democracy abroad.¹⁸ This national strategy is defined by "The Imperative of Engagement." This concept recognizes that the United States must lead abroad if we are to be secure at home and that American leadership and engagement in world affairs are critical to U.S. security making our nation and the world safer and more prosperous.¹⁹

To support the national strategy of engagement the Defense Department laid out a new military strategy and defense program to ensure U.S. national interests are promoted throughout the 1997-2015 period.²⁰ The defense strategy has three key elements. The ability to shape the international security environment in ways

favorable to the U.S.²¹ Having the capability to respond to the full spectrum of crises from deterring aggression, conducting small-scale contingency operations (SSC), to major theater wars (MTW).²² Finally, the Department must prepare for an uncertain future through focused development, modernization, and new organizations that are capable of exploiting new technologies.²³ The other essential factor in this strategy of being able to shape and respond is having the capability to rapidly move and concentrate military power from the U.S. and selected overseas areas -- the ability to conduct global power projection.

THE FUTURE BATTLEFIELD.

During the early part of the 21st Century the U.S. is unlikely to face any other major power with a huge military machine, rather the U.S. and other countries most likely battles will occur in small-scale wars or low-intensity conflicts.²⁴ The 1998 U.S. National Security Strategy reinforces this by stating, "smaller-scale contingency operations ... will likely pose the most frequent challenge for U.S. forces and cumulatively require significant commitments over time."²⁵ The most likely areas for conflicts to occur that will require U.S. engagement are on the periphery of Eurasia, Africa, and Latin America.²⁶ We can also expect that no nation, will directly challenge us on the battlefield like Saddam Hussein did in the Gulf War, as few leaders will make this mistake

in the future.²⁷ These conflicts will normally occur in developing areas of the world that are being increasingly urbanized, with large, generally poor, civilian populations that have limited/low-quality infrastructure (e.g., roads, bridges, buildings), except for the ability to disseminate information (e.g., TV, phone, fax, internet). All these trends have occurred in our numerous recent operations in Bosnia, Haiti, Somalia and our continued efforts against Iraq.

THE ROLE OF THE KING OF BATTLE -- FIELD ARTILLERY

MISSION.

FM 6-71 states, "The mission of the field artillery is to destroy, neutralize, or suppress the enemy by cannon, rocket, and missile fire and to assist in integrating all fire support into combined arms operations."²⁸

HISTORY.

During one of the first American conflicts closely observed, the Civil War, one of the immutable characteristics associated with the American way of war was discovered - "the willingness of Americans to expend firepower freely to conserve human life."²⁹ For the position warfare of World War I artillery provided massive and constant fire support for efforts ranging from support to friendly attacks and patrols, interdiction of enemy movement and fires to

repel enemy patrols and attacks. In World War II the U.S. relied on artillery to provide breakthrough firepower by concentrating the fires on a narrow point of attack to demoralize and open a hole for the infantry and armor to exploit.³⁰ During the Korean War artillery faced many of the same issues as in World War I with the most noted evolution being that the role of infantry changed to one of finding and fixing the enemy for artillery to destroy.³¹ In the Vietnam War, a small-scale contingency operation, the chief use of artillery was the firing of a few rounds³² in support of infantry operations with the characteristics of success being coverage and responsiveness.³³ During the Gulf War field artillery use followed the World War II model.

CURRENT DOCTRINE.

Field Manual (FM) 6-71, Tactics, Techniques, and Procedures for Fire Support for the Combined Arms Command, published in September 1994, provides the following considerations on the use of artillery:

- It is an area fire weapon. However point targets can be destroyed by special munitions.
- Limited ability to survive enemy ground, air, and artillery attacks.
- Best employed when massed on observed targets.
- Must be integrated with the maneuver plan.³⁴

FM 6-20-10, Tactics, Techniques, and Procedures for The Targeting Process, dated May 1996, provides current doctrine for the

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| <ol style="list-style-type: none">1. Command, Control, and communications2. Fire Support3. Maneuver4. Air Defense Artillery5. Engineer6. Reconnaissance, Surveillance, and Target Acquisition7. Radio Electronic Combat8. Nuclear-Chemical9. Petroleum, Oils and Lubricants10. Ammunition11. Maintenance12. Lift13. Lines of Communication |
|--|

Table 1 - Targeting Categories

artillery targeting process.

What is interesting about this publication is that the doctrine it discusses provides guidance only for Cold War/Gulf War type scenarios.

It provides guidance on targeting enemy combat systems, combat support systems or combat service

support systems in 13 doctrinal categories (see Table 1) and identifies weapons delivery systems to suppress, neutralize or destroy these target categories using the decide, detect, deliver, and assess methodology.³⁵ What is missing from current doctrine is planning for small-scale contingency efforts. In this regard, fire support doctrine does not provide much targeting guidance beyond stating, "Planning is different for a conventional war against a sophisticated enemy, requiring interdiction of operational targets, than that of operations other than war against a guerrilla force where targets are difficult to locate."³⁶

FIELD ARTILLERY VISION.

The Chief of the Field Artillery in his November 1998 State of the Field Artillery wrote, "The FA vision is a set of concepts that helps us prepare for the future while giving us the agility to respond to the rapidly changing technological and political environments of today. We must prepare to deliver full spectrum effects-from massed area fires to precision strikes to disabling equipment with non-lethal fires-whatever the force commander requires."³⁷

FIELD ARTILLERY MODERNIZATION DEVELOPMENTS

The Army has developed an overall modernization plan that lays out

"We must hold our minds alert and receptive to the application of unglimsped methods and weapons. The next war will be won in the future, not in the past. We must go on, or we will go under."

General Douglas MacArthur, 1931

how it plans to invest its resources to ensure tomorrow's soldiers are ready for war.

The Fire Support section addresses the modernization plans for artillery. Some key assumptions made in developing

the artillery section of the modernization plan are:

- We have entered a period without a peer threat
- The taking of moderate risks are acceptable

➤ That the fire support community needs to make use of this window of opportunity to modernize by the end of fiscal year 2012.³⁸

Lets now take a brief look at the emerging fire support systems being modernized, the essential research and development and leap-ahead technology being pursued.

ARTILLERY WEAPON SYSTEMS

PALADIN.

The improved Paladin 155-mm self-propelled howitzer is being fielded now with completion expected by the year 2000. This system has improved computer and navigation system, automatic gun positioning and improved ballistic and NBC protection. The system weights 32 tons, has a firing range of 30 km, fires at rates of up to 4 rounds/min and is accurate to 155 meters CEP.³⁹

CRUSADER.

The Crusader is a new system under development to provide a state-of-the-art 155-mm self-propelled howitzer that is highly survivable and capable of providing direct and indirect fire support at ranges (40-50 km), fire rates (10-12 rounds/minute) and accuracy (80 meter CEP) beyond any other cannon system. The key technologies involved in this system are an integral mid-wall cooled cannon, modular charge system, automated ammo handling, and enhanced survivability.

The system weights over 50 tons and only one system is transportable per C-17 or C-5 sortie. As part of the program a separate armored resupply vehicle is also being developed to provide automatic ammo resupply, fuel transfer, and improved mobility. The planned fielding date for the system is 2005. This system is going to be a technology carrier for other future ground weapon systems.

LIGHTWEIGH HOWITZER.

The Lightweight 155 howitzer (LW155) provides increased strategic and tactical mobility, increased rate of fire, and survivability over our current M198 towed system. This system is capable of self-locating itself and is digitized to the same capability as our current self-propelled howitzers.

ROCKET ARTILLERY SYSTEMS

MLRS.

The Multiple-Launch Rocket System (MLRS) is an artillery weapon capable of delivering large volumes of firepower in a short time against critical, time sensitive targets. The systems basic rocket warhead carries improved conventional submunitions, but the system is also capable of delivering any of the MLRS family of munitions. The MLRS weights about 28 tons and was capable of keeping up with the tanks and Bradley fighting vehicles during Desert Storm. Currently the system is being upgraded with an improved fire

control system and enhanced launcher mechanical system to provide more rapid response times to time-sensitive targets.

MLRS Extended-Range Rocket System.

This is an evolution to the basic MLRS rocket design to provide longer range and lower submunition dud rate. This is a free-flight, area-fire, artillery rocket capable of engaging targets out to 45 kilometers. The new submunition fuze reduces the danger of residual duds to friendly troops. Initial fielding of these rockets is planned for 2000.

MLRS Guided Multiple-Launch Rocket system (GMLRS).

This program continues to upgrade the current MLRS rocket and builds off the extended-range rocket. This upgrade transforms the free-flight MLRS rocket into a missile by adding a guidance and control package using an inertial measurement unit (aided by the global positioning system) to provide increased accuracy. The range of the system is increased to 60 kilometers. Production for this MLRS variant is scheduled to start in 2002.

Army Tactical Missile System (ATACMS).

The ATACMS Block I and IA provides division and corps commanders a long-range, surface-to-surface missile system for attacking targets at ranges between 165km to 300km. The base missile carries an antipersonnel/antimateriel (APAM) warhead that is effective against

stationary, soft targets. Currently the system is being upgraded to the ATACMS Block II and IIA missile family. The Block II provides the capability to deliver 13 brilliant anti-armor (BAT) or BAT improved submunitions that are capable of effectively engaging moving armor formations and cold, hard targets. The ATACMS Block II improvements are planned to enter final development and low-rate production in December 1999 and Block IIA enters Engineering Manufacturing Development phase in 1999.⁴⁰

High-Mobility Artillery Rocket System (HIMARS).

HIMARS is a lighter weight, more deployable MLRS system mounted on a medium tactical vehicle that is C-130 transportable and provides light forces with MLRS capability. The system is capable of launching the complete MLRS family of munitions to include all ATACMS variants. Currently prototype systems are undergoing evaluation with production planned to start in 2004.

SADARM.

Sense and Destroy Armor (SADARM) are fire and forget smart munitions capable of detecting and destroying armored vehicles. This program enters full rate production in 1999. There is also a preplanned product improvement (P3I) program to enhance SADARM performance that provides improved sensor capabilities (Laser Radar/Infrared) and greater lethal area coverage (doubles effectiveness of current SADARM projectile).

XM982.

This is an extended range, rocket-assisted, 155mm dual-purpose improved conventional munition that begins production in 2003. This new round provides increased ranges from 28 to 39 kms for current systems and a boost from 38 to 47 kms for the Crusader system.

EFOG-M.

The Enhanced Fiber Optic Guided Missile system is not discussed in the artillery modernization plan, but is capable of providing indirect fire support. Currently the system is being looked at as an antitank system as part of an Advanced Concept Technology Demonstration (ACTD). The EFOG-M system is mounted on a HMMWV, uses a two-man crew, and provides a day/night non-line-of-sight capability to defeat high-value targets. The operator flies the missile to the target via a fiber optic cable, is able to perform reconnaissance while flying to the target and has a FLIR/TV sensor for target acquisition and identification at endgame. The system is lightweight (air assault capable), capable of operating in poor weather conditions, and has a range of 15 kms.

COMMAND/CONTROL (C2) AND SENSORS.

The fire support modernization plan also provides new systems like the Advanced Field Artillery Tactical Data System (AFATDS), new observer vehicles like the STRIKER and BFIST, and improved target detection radars.

FIELD ARTILLERY GOALS VS. REALITY

The goals of the Chief of Staff and the Department of Defense were to use this strategic pause to exploit advances in technology, develop new operational concepts and organizational structures to ensure we were ready to fight on the 21st Century battlefield (see table 2). The Chief of the Field Artillery supported this vision when he stated, "To remain a relevant force for our nation's continued well-being, the Field Artillery must be able to respond to any range of threats and our ever-changing geopolitical environment in the years to come."⁴¹

- Power projection capable
- Small scale contingency operations the norm
- Causality adverse
- Greater moral/legal constraints on collateral damage
- Urban warfare / operations common
- For MTW - Greater dispersion & a non-linear battlefield
- Most likely MTW opponents have few tanks

Table 2 - 21st Century
Characteristics of War

Yet when we review what the field artillery community is doing doctrinally and for modernization we find this vision is not being accomplished. Rather we

find the army artillery community is still pursuing systems and doctrine suited to fight large scale massed forces (i.e., the Soviet hordes of the Cold War) rather than work on the battlefield of the 21st Century. The current artillery modernization plan is focused on providing increased volumes of indirect fire support against tanks and infantry formations. Yet, if we look at recent past history at operations in Vietnam (a better analogy to future wars than the Gulf) we find that very few targets warranted large volumes of fire, rather the key requirements were coverage and responsiveness.⁴² The artillery systems under development, especially the Crusader, cannot be readily deployed so with our limited lift capability they will either get left behind (ala Haiti, Bosnia, or Somalia) or arrives too late to be either effective or useful.

As Bevin Alexander states in THE FUTURE OF WARFARE, "Ground forces will place less dependence on heavy weapons, like the main battle tanks and artillery that are not immediately 'displaceable'. This is because the enemy will not concentrate his forces to allow Americans to destroy them easily."⁴³ Further, the ability to use artillery in a contingency operation, which is under close media scrutiny, where fratricide or collateral damage to populated areas is probable is highly likely to eliminate the use of massed fires altogether.⁴⁴ Can you imagine a commander developing rules of engagement that allows a Crusader to fire in a urban area, say at a

house, when its 80 meter CEP means that 50% of the time you destroy a house a block away? Just look at the recent press reports about Iraqi civilian deaths when an Air Force AGM-130A missile missed during Operation Desert Fox in December 1998. The Air Forces claim is that with the AGM-130A PGM we, "don't aim for the door, [we] aim for the door knob."⁴⁵ Yet, the best the Army can hope for with a Crusader is a 50-50 chance to hit a target on the same block!

In the area of doctrine the fire support community does a good job in discussing how to use artillery for massed fires and targeting against tanks or infantry in the field. They currently have a doctrinal void in how to deal with the use of artillery in urban areas and for Military Operations Other Than War (MOOTW). In urban warfare we have combat that is close-in and violent while the targeting of fires is "profoundly more challenging ... and targeting has to be in three dimensions at all times."⁴⁶ Yet no doctrine exists.

Two of the key principles of Joint MOOTW operations are restraint and legitimacy. Restraint requires that we "apply appropriate military capability prudently" because "the use of excessive force could adversely affect efforts to gain or maintain legitimacy and impede the attainment of both short- and long-term goals."⁴⁷ The principle of legitimacy means we must, "sustain the willing acceptance by the people of the right of the government to govern

or of a group or agency to make and carry out decisions."⁴⁸ The field artillery community needs to develop doctrine to meet these principles, for as Robert J. Scales Jr., said about artillery fires in Vietnam:

Although their effects on the enemy may never be known, H&I [Harassment and Interdiction fires] clearly had an adverse effect on civilians. Much of the growing anti-American feeling in populated and re-settled areas in Vietnam stemmed from the nightly discomfort induced by endless explosions and the real danger that an error made by a gunner or airman might result in injury or death.⁴⁹

RECOMMENDATIONS AND ALTERNATIVES

Let us now look at some recommendations and alternatives to better align field artillery modernization with U.S. military strategy and requirements so we get usable systems for army operations in the 21st Century. The discussion of proposed recommendations and alternatives will use the Army Requirements Determination process (i.e., doctrine, training, leader development, organization, materiel and soldier structure (DTLOMS)) as a guide.

DOCTRINE.

Before we begin the material development process we need to develop new fire support doctrine that matches our 21st Century warfighting

needs. Current doctrine needs to be updated to reflect the use of artillery in a much different environment than fighting the Soviet hordes of the Cold War or "dumb" Iraqi's in the Gulf. Doctrine needs to address artillery use in MOOTW operations, use of artillery in urban areas, and how to target military objectives while minimizing the effects of collateral damage. As the Gulf War Report to Congress states, "aircraft and munitions were selected so that attacks on targets within populated areas would provide the greatest possible accuracy and least risk to civilian objects and civilian populations."⁵⁰

As General Reimer states, "the types of operations we are involved in and the advent of the Information Age make it increasingly difficult to distinguish between tactical, operational and strategic levels of war and forces."⁵¹ Thus, the Air Forces strategic targeting experiences and lessons learned from the Gulf War and the recently conducted Operation Desert Fox provide a fertile ground for the Army to review and find concepts to update our field artillery doctrine for the 21st Century battlefield. The field artillery community could also look at Air Force Doctrine and how they address the issues of meeting these challenges (MOOTW, collateral damage) while also achieving the Joint Vision 2010 goal of providing precision engagement. It seems strange that the field artillery community fails to address this key tenet of Joint Vision 2010 in either doctrine or its modernization plan.

TRAINING.

Once we address the doctrinal void in field artillery operations we need to develop exercises and training scenarios to prepare our forces for use under actual conditions. We need to put a civilian urban area on the ground at the NTC where the artillery community has to address how they will minimize collateral damage. Our training exercises will need to address our ability to achieve first round hits on targets with very small errors -- precision engagement. This type of training is not currently being conducted at our combat training centers so how will we do it under operational conditions?

ORGANIZATION.

Here is where we could make some major changes in how we achieve our field artillery objectives, especially if we step back, challenge a few basic assumptions and are willing to take a more total force/Joint view.

If we look at the key generic requirements for field artillery in the 21st Century they are rapid deployment, capability to conduct precision strikes, quick response and ability to hit targets close and deep. If you think about it these requirements and the situations we will find ourselves deployed in are very similar to

what the Marine Corps has been doing for years. Given this similarity why not look at adopting the concept of the Marine air-ground task force (MAGTF). I am suggesting that we consider replacing most of our field artillery units in the active force with an organic aviation element. By doing this the organic aviation element will be capable of quickly deploying and provide the commander the capability to project power in depth and shape events in both space and time.⁵² The Gulf War Report to Congress reported that the Marines aviation element "were effective and responsive in their primary role of supporting ground forces. The AV-8B was successful in neutralizing the USMC main concern - long rang artillery."⁵³ The Gulf War Report also found that the Marines AH-1's "weapon flexibility was invaluable. AH-1s destroyed tanks, armored personnel carriers and vehicles, bunkers, and anti-aircraft artillery sites with TOW and Hellfire missiles and rockets, and guns."⁵⁴

With some creative thinking this concept could be quickly implemented with current DoD assets while we reviewed whether we needed to procure specialized aircraft for the mission. *I would propose that the Army link up with the Air Force reserve and have their A-10's units become the Army commanders aviation support element. For training and C2 purposes we could match A-10 units with specific army divisions so that we would gain the benefits of habitual association.* Further, with the Air National Guard and

Reserves purchase of the Situational Awareness Data Link (SADL) system we have the capability to provide air to ground and ground to air situational awareness and digital targeting operations for the conduct of precision strike operations. This concept not only provides the firepower required for most small scale contingency operations it also provides us the precision strike capability the field artillery currently does not have and is not developing. Army attack helicopters (AH-64's) could supplement these fixed wing aircraft just at the Marines do with their AH-1s. This package concept would provide superior deployability (e.g., six AH-64s vs. one Crusader per C-5 sortie), firepower greater than or equal to current plans, greater precision strike capability and a much lower cost (we all ready have the systems bought).

This package not only provides capabilities for MOOTW operations but also supports major theater war operations as demonstrated by the Marines success during the Gulf War. To round out this concept we might need to add some limited numbers of either HIMARS, EFOG-Ms or some other light but accurate artillery unit if we enter a period of sustained operations. In the longer-term we could look at buying additional aviation assets (AH-64s, Comanche, or maybe an armed RPV) for this mission.

If this concept were adopted we could reduce the size of the active duty field artillery structure and replace it with reserve or

National Guard units. This would allow us to still have the firepower required for a major theater war (i.e., Paladins and MLRS) where we must defeat either an armor or infantry heavy force in open battle. As demonstrated during the Gulf War we can activate ARNG field artillery units and deploy them effectively within the same time constraints it takes us to get active heavy forces deployed into a theater.⁵⁵

MATERIAL

Recommend that the Crusader program be terminated immediately. The types of operations/wars we will fight in the 21st Century do not support the need for a Crusader type artillery system. The two main reasons for buying this system; increased mobility and greater lethality are not key requirements for 21st Century operations. It appears we are buying Crusader because we are working on the assumption that we require a new artillery gun system to replace our old one we just upgraded. I am not sure this assumption is still true given the changes taking place in types of military operations, the need for precision strike weapons vice massed fire and finally the changing dynamics of the battlefield (more urban, greater dispersion of forces, etc). Given these changes it maybe time to think about retiring the artillery gun to the museum just like we did the cavalry horse and the air defense community did with its gun system Sgt. York.

The other reason for terminating Crusader is its loss would not impact our full spectrum war fighting capability due to the continued fielding and upgrading of our MLRS systems. Given the success of MLRS in the Gulf at effectively destroying a variety of targets (same target set as Crusader) at long ranges (equal to and with improved versions at longer ranges than Crusader) and ability to keep up and maneuver with our tanks and Bradleys our warfighting risk is low.⁵⁶ Besides terminating the Crusader program we should review our MLRS purchases to see if what we have is sufficient. Given the termination of Crusader we might need a few more MLRS units to provide firepower in case of a Gulf War II, however my initial feeling is we have sufficient numbers to meet the requirement and could potentially even live with a reduced buy of systems or munitions.

The material solution that the field artillery community needs to be looking for is one capable of providing a precision strike capability, able to provide short bursts of sustained firepower, is highly mobile and low cost. This type of system could be a derivative of the anti-tank FOG-M system, a UAV with weapons, or something new.

CONCLUSION

As General Reimer states, "This new course must and will be different from the one charted many years ago. The World has changed in countless ways, and we must accept and embrace these and future changes."⁵⁷ Our challenge is to be farsighted enough to see the implications these changes bring to us in doctrine,

organizations, and equipment. In the case of field artillery we are continuing down the path of the past by justifying the need for expensive systems based on an event we will likely never see again, the need to destroy massed tank and infantry formations. This is similar to the Air Forces continued support for buying the expensive B-2 bomber even though the Cold War ended and the need

*"America's Army is the best fighting force in the World today. It has this distinction because decades ago, **farsighted leaders developed warfighting concepts** that charted a course to the outstanding equipment, training programs, doctrine and soldiers that comprise today's Army. **Our challenge is to be as farsighted and chart the course that will maintain the Army's preeminent status as we move into the 21st Century.**"*

General Dennis J. Reimer
Chief of Staff, 1996

for a penetrating strategic bomber went away. In our case the world is changing, too, and we must have the courage to question whether, like the B-2, the requirement for a new field artillery gun that provides high rates of generally inaccurate fire (i.e., CEP of 80 meters) is valid. Like the Air Force, when the subject of whether the Crusader is really needed comes up, our answer tends

to be that the Crusader is a technology carrier for future land combat systems. The assumption underlying this assertion is that our future still lies in a tank like force of tracked vehicles. We need to understand that adoption of this line of thinking probably cuts off consideration of ideas like armored hovercraft, or even more futuristic ideas like null-gravity vehicles.

The risk we take in deferring any major modernization effort for field artillery is low as doctrinal and organizational changes, albeit with some political baggage, can provide us the type of fire support needed in the near term to support SSC operations and major theater wars. In addition, we have bought sufficient numbers of MLRS systems to provide the massed firepower needed to destroy massed enemy tank and infantry battlefield formations if that unlikely contingency occurs. We are also continuing to improve our MLRS system's capability (current field artillery modernization plan increases range, mobility and accuracy) to destroy tanks and APC's so why another new system?

Since we are in a period of strategic pause and we have ways to counter the full spectrum of threats envisioned we need to rethink our field artillery modernization plans. As showed above our stated goals and modernization strategy do not match. We are stating the right things but when you look at where we are investing it is still based on fighting the cold war threat. As the

old saying goes watch what we are doing not what we are saying. Therefore, we need to stop the Crusader program now, review the direction of our MLRS improvements and rethink our basic doctrine on field artillery employment. If we fail to do this we will fail to meet the challenge put forth by General Giulio Douhet that, "Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after they occur."⁵⁸

(Word Count: 5918)

ENDNOTES

¹ The White House, A National Security Strategy for A New Century, Washington, D.C.: October 1998, 1.

² William S. Cohen, Annual Report to the President and the Congress 1998, vii.

³ The White House, 1.

⁴ Institute for National Strategic Studies, Strategic Assessment Engaging Power for Peace 1998, 7.

⁵ Ibid., 7.

⁶ Paul Van Riper and Robert H. Scales Jr., "Preparing for War in the 21st Century," Parameters (Autumn 1997): 7.

⁷ James F. Dunnigan, Digital Soldiers (New York, NY: St. Martin's Press, 1996, 218.

⁸ Forrest R. Lindsey, "Focus on Expeditionary Fire Support", Marine Corps Gazette, 18.

⁹ Harvey M. Sapolsky and Jeremy Sapiro, "Casualties, Technology, and America's Future Wars", Parameters (Summer 1996), 2.

¹⁰ Ibid.

¹¹ Harry Summers, "Flight from the quagmire", Washington Times, 19 November 1998, p. 19.

¹² Military necessity: this principle justifies those measures not forbidden by international law which are indispensable for securing the complete submission of the enemy as soon as possible.

¹³ Discrimination: The necessity for distinguishing between combatants, who may be attacked, and noncombatants, e.g., civilians, who may not be attacked. A customary international law principle prohibiting the intentional attack of civilians. FM 27-10, para 40.

¹⁴ Proportionality: The loss of life and damage to property incidental to military action must not be excessive in relation to the concrete and direct military advantage expected to be gained. FM 27-10, para 41.

¹⁵ The Impact of New Technologies and the Law of Armed Conflict, LTC Barna, 1996. Legal Aspects of Future War Cases and Materials. David M. Crane editor, 1996, International and Operational Law Division The Judge Advocate General's School, U.S. Army Charlottesville Va.

¹⁶ David M. Crane eds., "The Impact of New Technologies and the Law of Armed Conflict," Legal Aspects of Future War Cases and Materials, (International and Operational Law Division The Judge Advocate General's School, U.S. Army Charlottesville Va, 1996), 3.

¹⁷ Gabrielle K. McDonald, Judge, "The Eleventh Annual Waldemar A. Solef Lecture: The Changing Nature of the Laws of War," Military Law Review, Volume 156 (June 1998), 35.

¹⁸ The White House, iii.

¹⁹ Ibid., 1-2

²⁰ Cohen, 5.

²¹ Ibid., vii.

²² Ibid.

²³ Ibid.

²⁴ Bevin Alexander, The Future of War, New York, NY.: W.W. Norton & Company, 1995), 45.

²⁵ Cohen, 21

²⁶ Alexander, 38.

²⁷ Ibid., 35.

²⁸ U.S. Department of the Army, Tactics, Techniques, and Procedures for Fire Support for the Combined Arms Commander, FM 6-71, (Washington, D.C.: U.S. Department of the Army, 29 May 1994, 1-2.

²⁹ Robert H. Scales Jr., Firepower in Limited Warfare, (Presidio Press, Novato, CA, 1995), 3-4.

³⁰ U.S. Department of the Army, Tactics, Techniques, and Procedures for Fire Support for the Combined Arms Commander, 9-10.

³¹ U.S. Department of the Army, Tactics, Techniques, and Procedures for Fire Support for the Combined Arms Commander, 18-19

³² The term few is relative to your point of view. To the United States a few rounds was not many but to the Vietnamese populous a few rounds was excessive due to the collateral damage inflicted in losses to life and property.

³³ Bruce I. Gudmundsson, On Artillery, (Prager Publishers, Westport, CT., 1993), 151-152.

³⁴ U.S. Department of the Army, Tactics, Techniques, and Procedures for Fire Support for the Combined Arms Commander, 1-2.

³⁵ Maj David A. Bushey et al., "Targeting on the LIC and PKO Battlefield: A PARADIGM SHIFT," Field Artillery (January-February 1999), 5-6.

³⁶ Ibid., 6.

³⁷ Major General Leo. J. Baxter, "Meeting the Future: State of the Field Artillery," Field Artillery, (November-December 1998), 1.

³⁸ U.S. Department of the Army, The United States Army Modernization Plan, (Washington, D.C.: Office of the Deputy Chief of Staff for Operations and Plans, 13 April 1998), E-9.

³⁹ Circular Error Probable (CEP). An estimate of the accuracy of a weapon used to determine the probable damage to a target. It is the radius of a circle within which half the projectiles are expected to fall.

⁴⁰ Association of the U.S. Army, "Field Artillery & Mortar Systems," Army Magazine 48, no. 10 (October 1998): 278.

⁴¹ Baxter, "Meeting the Future: State of the Field Artillery, 1.

⁴² Bruce Gudmundsson, On Artillery, (Westport, CT: Praeger Publishers, 1993), 151.

⁴³ Alexander, 83.

⁴⁴ Gregory E. Beach and Bruce A. Brant, "Fire Support Challenges in Contingency Operations," Field Artillery (September-October 1997): 19-23.

⁴⁵ "Air Force Says New Missile Right on the 'Door Knob'," European Stars and Stripes, 27 January 1999, p 4.

⁴⁶ Forrest R. Lindsey, "Focus on Expeditionary Fire Support," Marine Corps Gazette, (July 1998): 5.

⁴⁷ U.S. Joint Staff, Doctrine for Joint Operations, Joint Pub 3-0, (Washington, D.C.: Joint Staff, February 1995), V-3.

⁴⁸ Ibid., V-4.

⁴⁹ Scales, Firepower in Limited Warfare, 142.

⁵⁰ U.S. Department of Defense, Gulf War Report to Congress, (Washington, D.C.: U.S. Department of Defense, 1992), 612.

⁵¹ U.S. Department of the Army, Requirements Determination, (Fort Monroe, VA: U.S. Army Training and Doctrine Command, March 1996), 1.

⁵² U.S. Department of the Navy, Campaigning, Marine Corps Doctrinal Publication 1-2 (Washington, D.C.: Headquarters United States Marine Corps, August 1977), 30.

⁵³ U.S. Department of Defense, Gulf War Report to Congress, 673.

⁵⁴ U.S. Department of Defense, Gulf War Report to Congress, 668.

⁵⁵ The Gulf War Report to Congress states that two ARNG field artillery brigades were activated in November and early December of 1990 and were effective in providing fire support during the war, i.e., ready for battle within 60 days.

⁵⁶ U.S. Department of Defense, Gulf War Report to Congress, 752-754.

⁵⁷ U.S. Department of the Army, Requirements Determination, 1

⁵⁸ Department of the Army, The Army, Field Manual 100-1 (Washington, D.C.: U.S. Department of the Army, June 1994), 26.

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